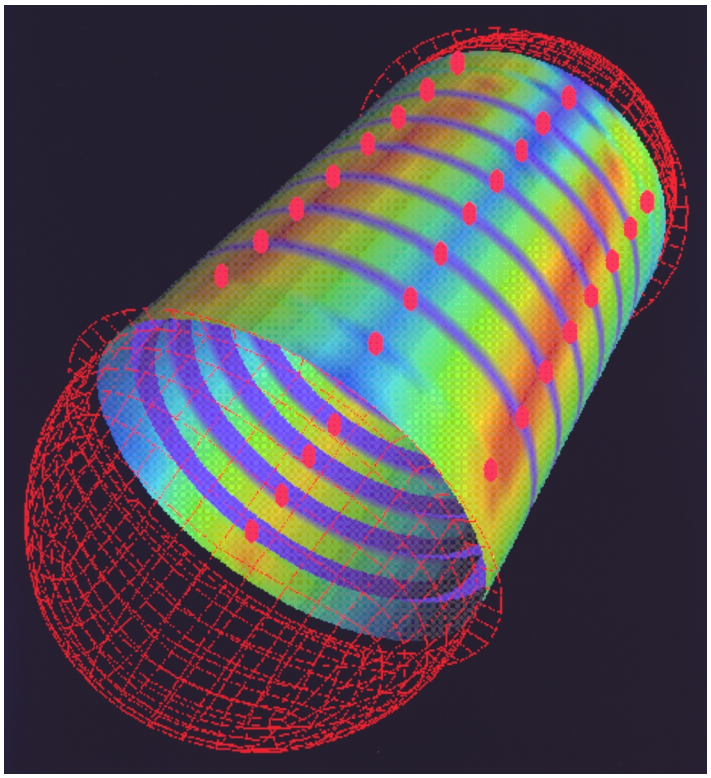
COMPOSITE HEALTH ASSESSMENT



Distribution of dissipated energy density (a measure of material health) computed from the strain fields "sensed" from sensors (red ellipses) embedded in the composite material of a stiffened composite cylinder under external pressure and bending.

The Composite Health Assessment program at the Naval Research Laboratory (NRL) is concerned with the prediction and utilization of the structural material health of composite structures with embedded or attached sensors. NRL has developed an advanced computational simulating technology that accepts sensor readings and converts them to spatial distributions of material health all over the hosting composite structures. This is achieved by using the dissipated energy density absorbed by the materials that results from strain-induced damage. Knowing the distribution of the material health and its evolution is very useful for performing sensor selection, sensor topology, sensor calibration, and sensor usage optimization.

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